



Draft
Environmental Assessment
City of Topeka
Flood Risk Management Study
Topeka, Kansas

April 2008

U.S. Army Corps of Engineers
Kansas City District
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Kansas City, Missouri 64106-2896

**CITY OF TOPEKA,
FLOOD RISK MANAGEMENT STUDY
ENVIRONMENTAL ASSESSEMENT
APRIL 2008**

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ENVIRONMENTAL ASSESSMENT
CITY OF TOPEKA,
FLOOD RISK MANAGEMENT STUDY
SHAWNEE COUNTY, KANSAS

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Kansas City District, has prepared this Environmental Assessment (EA) to evaluate the potential impacts associated with the recommended plan to provide flood risk management for the city of Topeka, Kansas. The Topeka Local Flood Protection Project is located at the confluence of Soldier Creek and the Kansas River, and is a unit of the Kansas River Basin System. The levee units in Topeka that are proposed for modifications in this plan are: South Topeka Unit, Waterworks Unit, Oakland Unit, and North Topeka Unit. The Auburndale and Soldier Creek units were studied for deficiencies in the early phase of the project. However, there were no deficiencies found; therefore, no work has been proposed for these units.

2.0 PURPOSE AND NEED FOR THE RECOMMENDED PLAN

The purpose of the recommended plan is to increase the reliability of the flood risk management system for the City of Topeka. The purpose of the recommended plan is to correct existing geotechnical and structural weaknesses and increase the reliability of the flood risk management system for the City of Topeka. The recommended plan is needed to reduce the risk to the local population from flooding due to levee failure and maintain the performance of the system as originally authorized and intended by Congress.

3.0 AUTHORITY FOR THE RECOMMENDED PLAN

This study is being conducted under the authority provided by Section 216 of the 1970 Flood Control Act. *(For more information, see the Feasibility Report page 3)*

4.0 PRIOR REPORTS

For information on prior reports, see the Feasibility Report.

5.0 PUBLIC INVOLVEMENT

A public meeting was held on 14 November 1996 at the Garfield Community Center in Topeka, Kansas. The purpose was to inform the public of the proposed study and to get feedback on the alternatives proposed in the study. Comments were addressed by USACE representatives and a record of these comments was included in the 1997 Reconnaissance Report. An additional public meeting will be conducted prior to completion of the Final Feasibility Report.

6.0 LEVEE UNIT DESCRIPTIONS

For levee unit descriptions, see the Feasibility Report.

7.0 DESCRIPTION OF THE RECOMMENDED PLAN

The recommended plan consists of the preferred alternatives for each levee unit. The preferred alternatives are considered to have the highest net benefits, formulated to minimize negative environmental impacts, and designed to maximize cost-effectiveness. The recommended plan for each levee unit is listed below. Figure references in this Environmental Assessment, unless otherwise noted, are directed to the project figures found at the end of the Feasibility Report.

Oakland Unit

At station 64+00 to 80+00, a new earthen underseepage berm would be installed on the landward side of the levee behind the water treatment plant (Figure 6). The berm would be placed along the toe of the levee for about 1,600 linear feet at a height of 6.5 feet, sloping to three feet thick at a distance of about 240 feet outward from the levee. About 84,500 cubic yards of fill would be used.

At station 75+50, heel extensions would be added to the manholes by placing concrete on the existing foundation of the structure to increase its capacity to withstand uplift pressures

At station 220+00, heel extensions would be added to the East Oakland Pump Station to mitigate uplift pressures (Figure 8).

At station 485+86 to station 491+01, two feet of additional fill would be required behind the floodwall to meet sliding stability requirements (Figure 7). About 388 cubic yards of fill would be used and would extend about five feet out from the floodwall centerline and taper at a 1:3 slope.

North Topeka Unit

At station 165+00 to 189+00, a new earthen underseepage berm would be installed on the landward side of levee (Figure 2). The berm would be placed along the levee for 2,400 linear feet, seven feet thick at the levee toe sloping to three feet thick at a distance of 220 feet using 122,250 cubic yards of fill.

At station 246+00 to 250+00, new pressure relief wells would be installed along the levee for about 400 linear feet. About six wells would be placed 75 feet apart and 75 feet deep. The wells would be designed to drain to a central manhole using a buried header system. The total discharge of the system would be one cubic foot per second per well. The local sponsor will be required to pump the water down one foot below the existing ground level when the river is near

the top of levee. A pad would be constructed on the slope for access. The North Topeka Railroad has a series of tracks just outside of the toe of the levee (about 100 feet from the levee). Temporary excavation for drilling access, a header pipe system and manhole installation would be done inside of the footprint.

At station 364+60, the existing Fairchild Pump Station (no longer used for flood risk management), would be removed (Figure 10). However, the below ground level structures (including the wet well and inlet/outlet pipes) would be left in place, filled with concrete-like material, and then covered with soil.

South Topeka Unit

At station 22+00 to 48+00, a new earthen underseepage berm would be installed on the landward side of the levee (Figure 4). The berm would be installed at the toe of the levee for about 2,200 linear feet, five feet thick at the levee toe sloping to three feet thick at a distance of 100 feet outward from the levee. About 48,150 cubic yards of fill would be used.

At station 74+41 to 93+86, the existing South Topeka floodwall would be removed and replaced (Figure 3). The existing floodwall is 1,944 linear feet of timber pile-founded concrete, about ten to 12 feet above ground and five to ten feet below grade. The existing wall is about one foot thick. The new floodwall would be concrete, and built along the existing wall alignment to the same length and height. About 3,322 cubic yards of concrete would be needed to construct the new floodwall and about 5,000 cubic yards of fill would be stockpiled on site to fill four floodwall monolith openings. The floodwall would be rebuilt in sections by demolishing and rebuilding one section at a time, driving foundation piles, and installing new pile caps. Also, a working platform would be constructed on the bank of the river. For the platform, material would be placed on the river side slope of the floodwall to provide an area wide enough for the placement of construction equipment. This platform is not likely to extend in or impact the river itself. Access to this area would be from the landside through the first removed section of the existing wall. After completion of the access/working area on the river side of the existing wall, removal of the remaining existing wall and construction of the new wall would be done from both sides of the wall. No more than four sections of the existing wall would be open at one time. The stockpiled fill would be used to close the sections as needed in case of flooding during construction.

The existing gate wells at stations 69+22, 75+62, 86+09, and 86+55, and the existing riverside sluice gates at stations 88+69 and 91+02 would be replaced as part of the floodwall replacement.

At stations 16+07, 84+10, and 85+57 the existing manholes would require heel extensions to mitigate uplift pressures. At station 75+84, a wall stiffener at Kansas Avenue Pump Station would be installed to meet the required strength factor for safety (Figure 3).

Waterworks Unit

At stations 0+78 to 7+00 and 10+00 to 16+50, two feet of additional fill would be required behind the floodwall to meet sliding stability requirements (Figure 5). About 1,272 linear feet of fill would be placed five feet out from the floodwall centerline and tapered on a 1:3 slope.

At stations 13+07 and 15+95, two feet of backfill would be placed behind the stop-log gap sidewalls¹ to address sliding stability (Figure 5). A total of 958 cubic yards of fill would be used to meet sliding stability requirements.

Borrow Areas

Implementation of the preferred alternative would use borrow from locations close to the existing levee alignment to minimize haul distance costs and allow access to existing local haul routes. The use of conventional scrapers, front end loaders, backhoes and haul trucks would be more economical than dredging materials from the Kansas River. To minimize environmental impacts on floodplain terrestrial habitat, borrow material would come from two areas within the Oakland and South Topeka units.

Oakland West borrow area: This site would be used to provide material for the underseepage and stability berm in the Oakland Unit. The borrow site is on the river side of the levee between river miles 82.1 and 81.0 in Shawnee County, Kansas (Figure 12) and is currently used for row cropping. Soils in this area are primarily from the Eudora-Muir association. About 84,888 cubic yards of material is required for the proposed work. The area needed for borrow is about 19.3 acres. This would include two borrow cells 1,400 feet by 300 feet excavated three feet deep. A 100 foot buffer between each cell would be maintained to allow equipment movement and ensure foreshore stability. To avoid impacts to treed areas, the cells would be located at least 50 feet from the tree line. Also, cells would be located at least 100 feet from the existing levee and more than 400 feet from the Kansas River.

South Topeka borrow area: This site would be used to provide material for the proposed underseepage berms at South Topeka and North Topeka units and the floodwall stability berms in the Waterworks Unit. The proposed borrow area is located riverward of the levee between river miles 86.9 and 86.1 in Shawnee County, Kansas (Figure 11). The proposed area is currently used for row cropping. Soils in this area are primarily from the Eudora-Muir association. About 171,344 cubic yards of material is required for the proposed work. The surface area needed for borrow is about 27.3 acres. It would have three borrow cells 1,000 feet

¹ Stop-log gaps are openings in the floodwall for roads, railroad tracks, gates, etc. and are so named because during a flood they are closed by stacking logs (railroad ties in most cases, aluminum "logs" in newer applications) in the opening. At each end of the opening is a groove in the wall that guides the placement of logs and holds them in place when the water rises. The section of the wall that contains the stop-log guide is referred to as the stop-log gap sidewall. The purpose of the stability berm behind these sections is to improve the structural factor of safety against sliding of the wall while under pressure from floodwaters.

by 400 feet excavated to four feet, each providing about 59,259 cubic yards of fill. Also, a 100 foot buffer between each cell would be maintained to allow equipment movement and insure foreshore stability. To avoid impacts to treed areas, the cells would be located at least 50 feet from the tree line. Also, cells would be located at least 500 feet from the existing levee and more than 300 feet from the Kansas River. These distances should prevent underseepage impacts and maintain bank stabilization.

Construction Schedule

Construction activities are expected to begin in 2010 and continue for a 3-year period thereafter.

Non-Government Land

The total project needs are 217 acres. Of this, 191 acres are for temporary construction easements, and 26 acres of sponsor-owned land used in perpetuity for the mitigation site.

Waste Disposal

The project construction would generate wastes from the removal of the floodwall and pump station. Anticipated wastes such as concrete and steel materials would be disposed at an existing commercial-land fill near the project area. Wastes generated from tree removal would be chipped and hauled offsite to a lumber mill or designated lumber stockyard.

8.0 ALTERNATIVES ORIGINALLY STUDIED BUT REMOVED FROM FURTHER CONSIDERATION

Several structural and non-structural alternatives were considered during the initial screening process, but were eliminated from further review because they did not meet the minimum technical criteria for the expected flood conditions. For a complete description of the structural and non-structural alternatives considered, but eliminated, see the Feasibility Report or Table 1 of Appendix A.

8.1 ALTERNATIVES CONSIDERED FURTHER

Pressure Relief Wells Alternative

Under this alternative, the proposed actions would be the same as those described in the recommended plan except pressure relief wells would be installed in place of proposed underseepage berms on the North Topeka, South Topeka and Oakland Units. With the use of pressure relief wells in place of berms, the amount of borrow material required for the Waterworks and Oakland unit stability berms would be greatly reduced. Both the Waterworks and Oakland stability berms could be supplied by a single borrow cell. The cell at Waterworks would measure about 175 feet by 150 feet wide and 1 foot deep, and the cell at Oakland would

measure about 105 feet by 100 feet wide and 1 foot deep.

Commercial Fill Alternative (All Units)

Under this alternative, the proposed actions would be the same as those described in the recommended plan except commercially obtained fill instead of borrow pits would be used. Commercially obtained fill would likely come from permitted dredging operations in the Kansas River. This could possibly provide a cost savings and minimize the environmental impact of borrow operations. At this time, only one commercial dredger is operating on the river in the Topeka area; and another is seeking a permit to operate a dredge in another reach east of Topeka. However, there is concern that these operators may not be able to provide the quantities necessary in addition to satisfying their existing commercial demands. The estimated amount of commercial fill needed is about 281,000 cubic yards.

No-Action Alternative (All Units)

Under the no-action alternative, the recommended plan would not be constructed by the Corps of Engineers.

9.0 ENVIRONMENTAL SETTING

General

The lower Kansas River basin includes three natural vegetation types: floodplain habitat consisting of cottonwood and willow trees (*Populus-Salix*), oak-hickory forest (*Quercus-Carya*) and bluestem prairie (*Andropogon-Panicum-Sorghastrum*). Typical dominant over story vegetation that may be found in the study area include American elm, American sycamore, eastern cottonwood, willow, beech, black walnut, and various oak species. Other plant species typically found in the area include maple, hackberry, hawthorn, honey locust, Osage orange, redbud, rough leaf dogwood, and slippery elm. Typical under story vegetation that may be found include reproduction of these species, with the ground layer containing species such as gooseberry, poison ivy, greenbrier, and prairie rose.

Climate

Topeka, Kansas has a typical continental climate. Characteristics of this climate are warm to hot summers, cold winters, moderate surface winds, and maximum precipitation in the warm season. In the winter months (December through February), the average daily temperature is 31.0 degrees Fahrenheit, the average daily minimum and maximum are 20.4 and 40.6 degrees Fahrenheit, respectively. In the summer months (June through August), the average daily temperature is 76.8 degrees Fahrenheit. The average daily minimum and maximum temperatures are 65.1 and 87.3 degrees Fahrenheit. Precipitation is the heaviest from May through September when much of it falls during late evening or night time thunderstorms. The total average annual precipitation is 33 inches and the average annual snowfall is 21 inches.

Soils

The soils in the Topeka, Kansas area and floodplains of the surrounding streams are part of the Eudora-Muir soils association. The Eudora soils make up about 33 percent of this association; Muir soils, 25 percent; and minor soils, the remaining 42 percent. The Eudora soils occur mostly on intermediate levels in the valley and are above ordinary overflow of the Kansas River. Eudora soils are nearly level, well drained, light, and loamy. Their surface layer is grayish-brown silt loam about 12 inches thick. It is underlain by coarse loam or silt loam to about 42 inches. The material below this is stratified coarse silt loam to fine sand. Muir soils occupy intermediate and high levels of the river valley. They have a smooth surface and are nearly level and well drained. Their surface layer is dark-gray silt loam about 8 inches thick. The subsoil, about 54 inches thick, is silt loam to 20 inches and is silty clay loam below that depth. The rest of the association consists mainly of Kimo and Eudora soils that are closely intermingled with Sarpy and other soils. The Sarpy-Eudora complex consists of well-drained soils. These soils formed in medium-textured to moderately coarse textured alluvium and occur on the floodplain of the Kansas River. They experience occasional flooding, except in areas protected by the levee. Also, the soils survey for Shawnee County indicates that nearly all of this association outside of the municipal areas is used for cultivated crops. Corn, wheat, soybean, grain sorghum, and alfalfa are the primary crops.

Also, soils from river wash are typically found along the Kansas River. River wash soils consist of an unstable accumulation of sandy and silty alluvium. It occurs as sandbars and islands along the Kansas River and is only slightly above the riverbed. River wash is not suited to cultivated crops or pasture. Willows and cottonwoods are the native trees.

Floodplain Characteristics

Commercial, industrial, and residential developments are located in the floodplain of the study area behind the different levee units. Numerous city streets, county roadways, highways and railroads cross the floodplain. Also, the Philip Billard Airport, one water treatment plant, and two sewerage treatment plants are located in the floodplain.

10.0 AFFECTED ENVIRONMENT

The affected environments and resources described in this section are those recognized and required to be considered by various laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies; groups or individuals; and, the general public. The impacts of environmental resources addressed are summarized in Table 2 (Appendix A).

10.1 KANSAS RIVER AND ITS AQUATIC RESOURCES

Floodplain Description

The Kansas River is a major right-bank tributary of the Missouri River that begins at the confluence of the Republican River and Smoky Hill River near Junction City, Kansas. It flows 170.5 miles to its mouth in Kansas City, Kansas, where it joins the Missouri River at river mile 367.4 between the Fairfax-Jersey Creek and Central Industrial District Levee Units. The Kansas River basin above Topeka, Kansas, has 56,720 square miles of contributing and non-contributing surface area. Of this drainage, about 42,000 square miles are modified by existing reservoirs (Kansas Geological Survey, 1998). There are 16 Federal reservoirs within the basin that impact flow at Topeka. The project area is located within the Kansas River Middle Subbasin in Shawnee County, Kansas and the drainage area is about 500 square miles between Topeka and Wamego (KDHE, 2000). Solider Creek is the north bank tributary of the Kansas River at Topeka. Its basin is about 157 square miles and traverses southern Nemaha, Jackson and northern Shawnee counties flowing in a south-southeasterly direction. Shunganunga Creek flows northeasterly across the southern portion of the City of Topeka and joins the Kansas River about two miles east of the city. In addition, the Kansas River is listed on the Nationwide Rivers Inventory (NRI). The purposes of the inventory are several, including the identification of rivers which have potential to qualify for inclusion in the National Wild and Scenic Rivers System. The Kansas River was included in the inventory because of its outstanding scenic, recreational, fish, wildlife, and cultural values.

Water Quality

The designated uses for the Kansas River Middle Subbasin are Primary and Secondary Contact Recreation, Special Aquatic Life Support, Domestic Water Supply, Food Procurement, Irrigation, Industrial, Groundwater Recharge, and Livestock (Kansas Department of Health and the Environment, 2000). Water quality is monitored daily by the Kansas Department of Health and Environment (KDHE) at two sites along the Kansas River in Topeka, Station 258 at Topeka and Station 143 east of Topeka. The Kansas River Middle Subbasin is listed under Section 303(d) of the Clean Water Act as impaired waters by KDHE for not supporting Secondary Contact Recreation. Also, KDHE waste load modeling indicates impairment to aquatic life from elevated ammonia concentrations in the river at low flows. Historically, elevated ammonia concentrations in the river have been known to impact aquatic plants and animals, as well as affect primary and secondary recreation uses such as swimming and fishing. There are a number of National Pollution Discharge Elimination System permitted facilities along the river segment; however, only two discharge ammonia under their permits. Both permits are held by the City of Topeka (KDHE, 2000).

Aquatic Species

A list of typical fish species found in the project area can be obtained in the 2007 USFWS Coordination Act Report (Appendix C). The fisheries resources in the Middle Subbasin of the Kansas River are at their most sensitive during the spring spawning season, which is greatly influenced by flow releases from upstream reservoirs, especially Tuttle Creek Lake.

Future Conditions with Recommended Plan

No adverse impacts to aquatic resources or water quality are anticipated to occur from the implementation of the proposed plan. Construction activities for levee modifications would occur on the landward side of the levee, with the exception of riverward borrow construction areas. Replacement of the floodwall would occur along the existing alignment, and the floodwall platform is not anticipated to extend into or otherwise impact the river. Also, best management practices would be used to minimize the incidental fallback of material into the river during construction. Removal of the Fairchild Pump Station would not affect aquatic resources or water quality since the wet well and inlet/outlet pipes would not be removed.

Also, no adverse impacts to aquatic resources or water quality are anticipated to occur from soil borrowing activities. For all construction activities, best management practices would be used to minimize the introduction of fuel, petroleum products, or other deleterious material from entering into the waterway and adjacent resources. Such measures would include use of erosion control fences; storing equipment, solid waste, and petroleum products above the ordinary high water mark and away from areas prone to runoff; and requiring that all equipment be clean and free of leaks. Furthermore, all disturbed areas would be graded and seeded following construction. To prevent the spread of exotic and invasive species all equipment moved to and from the site would be thoroughly washed, and cleaned of any visible mud, seeds, plants, or animals.

Future Conditions with Use of Commercial Fill

This alternative is a modification to the Recommended Plan in which fill would be obtained from permitted dredging operations in the Kansas River. To address river bed degradation and other dredging-related impacts to the morphology and ecology of the river, the Corps implemented the Regulatory Plan for Commercial Dredging Activities on the Kansas River (1990). The Regulatory Plan contains restrictions that have been developed and implemented to limit the adverse impacts associated with commercial dredging activities on the Kansas River. The restrictions are intended to limit those impacts to a level which will have only minor effects on the morphology and ecology of the river and on public and private interests located in and along the river. No additional impacts are anticipated to occur from the use of commercial fill for levee berms. Fill will be deposited on dry land, more than 500 feet away from any water resource. To prevent fill from reaching water sources by wind or runoff, fill would be covered, stabilized or mulched, and silt fences would be used. With these management practices applied, the chances of the fill moving and reaching water resources is negligible.

Future Conditions with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system. However, in the absence of Federal action addressing levee improvements, a high water event could result in the release of a variety of industrial chemicals and

substantially impact the natural and human environment within the project area. Levee failure could result in adverse impacts to water quality from increased levels of nutrient loading and wastes, including runoff of pollutants from industrial sources, petroleum products, and non-point sources of human and animal wastes.

Future Conditions with Relief well Alternative

Under this alternative, relief well systems would be installed in lieu of berms at the North Topeka, South Topeka and Oakland levee units. The risk of encountering groundwater contamination was evaluated in the 2007 HTRW assessment (Appendix H). Based on the assessment, there is a potential risk that soil contamination may be encountered in the North Topeka unit where a relief well is proposed. This is due to a railroad located in close proximity of the site. Therefore, the design of the relief well system would minimize soil disturbance to the greatest extent practical, and any soil that is removed from the site during construction would be tested to ensure proper disposal. However, the risk of groundwater contamination at the South Topeka and Oakland sites is considered low because there are no known contaminated sites located in close proximity of the sites. No substantial post-construction impacts to water resources or water quality are anticipated from the installation of relief wells.

10.2 WETLANDS

This resource is institutionally important because of the Clean Water Act of 1977, as amended and Executive Order 11990 of 1977 (Protection of Wetlands). Wetlands are important because they provide habitat for various species of plants, fish, and wildlife, serve as ground water recharge areas, provide storage areas for storm and flood waters, serve as natural water filtration areas, provide protection from wave action, erosion, and storm damage, and provide various consumptive and non-consumptive recreational opportunities. Wetlands are publicly important because of the high value the public places on the functions and values that wetlands provide.

No Impact to Wetlands Determination

The National Wetland Inventory database maps for the project area were consulted to determine wetland classifications within the project area. Also, Corps staff conducted wetland delineations on 13 October 2006. No wetlands were found within the proposed borrow areas on the riverward side of the levee or any other areas within the project footprint. The most likely areas to support wetlands are the riparian zones riverward of the levee where borrow material would be obtained. However, these areas did not meet the criteria for wetland classification; they contained either upland tree species, or agriculture, and they did not exhibit evidence of saturated or inundated soils.

10.3 PRIME AND UNIQUE FARMLAND

These resources are institutionally important because of the Food Security Act of 1985, as amended, and the Farmland Protection Policy Act of 1981. They are technically important

because they provide habitat for open and forest-dwelling wildlife, and the provision or potential for provision of forest products and human and livestock food products. These resources are publicly important because of their present economic value or potential for future economic value.

Existing Conditions

There are many areas of cropland in close proximity to the project sites, including within some of the proposed borrow sites. The National Resource Conservation Service (NRCS) was consulted for a determination of prime farmlands within the project area. Both the Oakland and South Topeka proposed borrow areas are considered prime farmland. However, the North Topeka agriculture area is not considered prime farmland. The major crops planted are corn and soybeans.

The NRCS defines three main categories of farmland: prime, unique, and farmland of statewide importance. These are primarily based on soil type and the historic use of the land for farming. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It must contain an adequate supply of moisture, acceptable acidity or alkalinity and sodium content, and few or no rocks. Also, it is not excessively erodible or saturated with water for long periods, and slopes between zero to eight percent. Unique farmland has a unique set of chemical and physical properties for producing certain high-value crops. Farmlands of statewide importance contain soils that do not meet the requirements for prime farmlands.

Future Conditions with the Recommended Plan

With the implementation of the recommended plan, beneficial impacts would consist of an increase in the reliability of the existing levee system that protects agriculture lands by reducing the risk of flood damage. Adverse impacts would include short term and minor impacts to three agriculture areas for obtaining borrow. Approximately 19.3 acres of the 98-acre Oakland site and 27.3 acres of 138-acre South Topeka site would be used for obtaining borrow. In addition, 12 acres of the North Topeka site would be disturbed from construction of the underseepage berm.

Prior to construction, the Corps will consider and discuss opportunities to restore the borrow areas in an environmentally acceptable manner with the land owners and the local sponsor, the community, and local resource agencies. Alternatively, the borrow areas can be returned to agricultural uses. If this is the preferred future condition, steps would be taken to minimize impacts and allow these areas to return to agricultural use after construction operations. Such measures would include preservation of the top layer of soil, which would be returned to the site, minimizing excavation depths to reduce impacts to the drainage of fields, and excavating after the harvest season to minimize impacts to crops.

Future Conditions with the Use of Commercial Fill

With this possible modification to the Recommended Plan, there would be no excavation required to obtain borrow fill, and disturbance of cropland would be limited to the construction of under seepage berm within the North Topeka unit. This disturbance would be short term and minor as farming operations would be allowed to return once construction is completed. Also, the beneficial impacts of this plan would be the same as those described under the recommended plan.

Future Conditions with the No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system. In the absence of Federal action addressing levee improvements, a high water event may result in inundation of agricultural lands for long periods of time causing loss of crops.

Future Conditions with the Relief well Alternative

Under this alternative, the amount of borrow material required would be substantially less than the amount required under the recommended plan; about 1,346 cubic yards for construction of stability berms in the Oakland and Waterworks units. The waterworks stability berm could be supplied by a single borrow cell 175 ft. by 150 ft. wide and one foot deep, and the Oakland stability berm could be supplied by a single borrow cell 105 ft. by 100 ft. wide and one foot deep. Therefore, the impacts on prime farmland areas would be minor and short term.

10.4 FOREST/WILDLIFE RESOURCES

This resource is institutionally important because of Section 906 of the Water Resources Development Act of 1986, and the Fish and Wildlife Coordination Act of 1958, as amended. Forest is technically important because it provides necessary habitat for a wide variety of species, it often provides a variety of wetland functions and values, is an important source of lumber and other commercial forest products, and provides various consumptive and non-consumptive recreational opportunities. Forest is also important because the general public highly values it for aesthetic, recreational, and commercial uses. Wildlife is technically important because they are a critical element of many valuable aquatic and terrestrial habitats; an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources. Wildlife is publicly important because of the high priority that the public places on their aesthetic, recreational, and commercial value.

Existing Conditions

Most of the forest and woodland in the study area has been greatly impacted by urban development. The impacts of the project to woodland and wildlife habitat within the project area are limited to the work within the South Topeka unit and construction of borrow areas.

The quality of the woodland within the South Topeka unit is considered moderate, and the age of the woodland stand is assumed to be about 30 years old. This woodland is part of the floodplain forest that extends along the Kansas River. The floodplain forest is considered the highest quality habitat in the Topeka area. A list of typical plant species found in the project area can be found in the mitigation plan (Appendix F).

Various wildlife species can be found using the riparian woodlands and grasslands along the banks of the Kansas River. These riparian areas provide food and cover for many wildlife species including various birds, mammals, reptiles, and amphibians. A list of typical species found in the project area can be found in the 2007 USFWS Coordination Act Report (Appendix C).

A community habitat suitability model for bottomland hardwoods (LDNR, 1994) was used to quantify net gains and losses of ecological value associated with future with project and future without project conditions, and the results are summarized in the mitigation plan (Appendix F).

Future Conditions with Recommended Plan

With implementation of the recommended plan, impacts to wildlife habitat would result from the removal of about seven and one-half acres of woodland for the construction of the underseepage berm at the South Topeka levee unit. Reducing the size of this woodland would result in a reduction in habitat quality and increase in competition among wildlife for available resources. In addition, during construction activities, wildlife species such as deer, and small mammals would most likely be temporarily displaced to adjacent woodlands and would be expected to return once project activities are completed. Wildlife species most likely at risk to be adversely impacted by the project action would include reptiles, amphibians and birds (USFWS, 2007). However, to minimize the impacts on migratory bird nesting, construction activities would be avoided in woodland areas during the nesting season from April 1 to July 15. In addition to offset the loss of this habitat, replacement of 15-acres of riparian habitat would be implemented. The results of the habitat model indicate a total of 15 acres of mitigation would provide enough compensation to offset the loss of 7.5 acres. The replacement habitat is expected to take up to 30 years to equal the value of the existing site. However, the production of soft mast and other edible seeds is expected to begin at about age ten.

In addition, any grassland areas disturbed from construction activities would be re-seeded following construction with rye, brome, fescue and then mulched. The entire mitigation plan can be found in Appendix F.

Future Conditions with Use of Commercial Fill

Impacts to woodlands would result from the removal of about seven and one-half acres of woodland for the construction of the underseepage berm at the South Topeka levee unit. Mitigation measures would be the same as those described under the recommended plan.

Future Conditions with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system; and the existing woodland is expected to continue to grow and reach full maturity by age 50, but would be subject to the potential risk of prolonged flooding due to levee failure. Vegetation that cannot tolerate prolonged flooding would experience anoxic stress and would die. Wildlife not adaptable to flooded conditions would be temporarily displaced until the water recedes.

Future Conditions with Relief well Alternative

With the installation of relief wells instead of the proposed underseepage berms, the amount of borrow material required would be less and impacts to woodland areas would be avoided. Therefore, there would be no mitigation needed, and impacts on wildlife habitat would be minor and limited to grass and cropland areas. Grassland areas disturbed from construction activities would be re-seeded following construction with rye, brome and fescue and mulch.

10.5 ENDANGERED OR THREATENED SPECIES

This resource is institutionally important because of the Endangered Species Act of 1973, as amended, and the Bald Eagle Protection Act of 1940. Endangered or threatened species are technically important because the status of such species provides an indication of the overall health of an ecosystem. These species are publicly important because of the desire of the public to protect them and their habitats.

Existing Conditions

There are three federally-listed species that may occur within the project area: bald eagle (*Haliaeetus leucoccephalis*), Least Tern (*Sterna antillarum*), and Piping Plover (*Charadrius melodus*). However, no impacts to federally-listed threatened and endangered species are anticipated to occur as a result of the project action. The USFWS concurred with our determination by letter on May 29, 2007.

State listed endangered species in Shawnee County were obtained from the Kansas Department of Wildlife and Parks (KDWP) website (Appendix D). They include the American burying beetle (*Nicrophorus americanus*), Eskimo curlew (*Numenius borealis*), least tern, peregrine falcon (*Falco peregrinus*), silver chub (*macrhybopsis storeriana*), and whooping crane (*Grus americana*). State listed threatened species include the bald eagle, eastern spotted skunk (*Spilogale putorius*), piping plover, smooth earth snake (*Virginia valeriae*), snowy plover (*Charadrius alexandrinus*), sturgeon chub (*Macrhybopsis gelida*), and Topeka shiner (*Notropis Topeka*). No impacts to state-listed endangered or threatened species are anticipated to occur as

a result of the project action. The KDWP concurred with our determination by letter on June 1, 2007.

Bald eagle. Also federally-listed, they typically are found roosting near reservoirs and large rivers in Kansas during the winter months. Known nesting areas include Perry Reservoir (northeast of Topeka), Clinton Reservoir (southeast of Topeka), and the Kansas River, with parents and young remaining in the area during the spring and summer months.

Least tern. Also federally-listed, they are summer residents in Kansas. Nesting birds have been recorded in six central and western Kansas counties, at Jeffery Energy Center, and along the Kansas River. Terns require barren areas near water such as saline flats in salt marshes, sand bars in river beds, and shores of large impoundments. A dependable food supply of small fish and aquatic crustaceans must be nearby. Least terns may occur accidentally or occasionally as transients anywhere in the state.

Piping plover. Also federally-listed, they are rare migrants through Kansas. They require sparsely vegetated shallow wetlands, open beaches and sandbars adjacent to or within streams and impoundments. Nesting has been recorded on sand bars along the Kansas River. Piping Plovers may occur occasionally anywhere in the state where suitable habitat is found.

Future Conditions with Recommended Plan

With implementation of the recommended plan, impacts to federally-listed species are not anticipated. This is because no work is proposed on the river itself that could affect habitat for piping plovers and least terns. Also, bald eagle habitat would be avoided; this includes any trees within 100 feet of the bank of the river which are over 50 feet in height and/or greater than 12 inches in diameter at breast height. In addition, no impacts to state-listed species are anticipated to occur from the proposed action.

Future Conditions with Use of Commercial Fill

If used, commercial fill would come from a preexisting site and/or from the Kansas River under the authority of the Corps Regulatory Program. To address river bed degradation and other dredging-related impacts, the Corps implemented the Regulatory Plan for Commercial Dredging Activities on the Kansas River (1990). The Regulatory Plan contains restrictions that have been developed and implemented to limit the adverse impacts associated with commercial dredging activities on the Kansas River. The restrictions are intended to limit those impacts to a level which will have only minor effects on threatened and endangered species and their habitat. No additional impacts are anticipated to occur from the use of commercial fill for levee berms.

Future Conditions with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk

management system. In the absence of Federal action addressing levee improvements, a high water event could result in the release of a variety of industrial chemicals and substantially impact the natural and human environment within the project area. Levee failure would result in substantial impacts to a water quality, fisheries and wildlife, extensive property damage and potential loss of human life.

Future Conditions with Relief Well Alternative

With the installation of relief wells instead of the proposed underseepage berms, the amount of borrow material required would be less and impacts to woodlands would be avoided. Also, no work would be done on the river; therefore, there would be no impacts under this alternative.

10.6 CULTURAL RESOURCES

In compliance with National Historic Preservation Act, the Corps conducted a review of the National Register of Historic Places (NRHP), an appropriate records search at the Kansas State Historical Society, and a field reconnaissance of the project area. No NRHP properties are recorded in any of the proposed project locations or potential borrow areas. Also, the records search found no other archeological sites, historic structures, or shipwrecks recorded within any of these areas.

The field reconnaissance found that all of the areas have been severely disturbed by the existing levee construction or are located on recently accreted land and have little possibility of containing archeological sites or structures eligible for inclusion on the (NRHP). The Corps coordinated the results of the record search and reconnaissance with the Kansas State Historic Preservation Officer (SHPO) and recommended no further work for the project and that the project be allowed to proceed without further coordination with their office in letters dated June 13 and August 2, 2006. SHPO concurred with these recommendations on July 5 and August 2006 respectively. The Corps will also coordinate the project with affiliated Native American tribes. If additional ground disturbing activities are needed for the project, further coordination with SHPO and Native American tribes would be required.

Also, in the unlikely event that archeological deposits or other cultural resources are encountered during construction, work in the area of discovery would cease. Before resuming, the inadvertent discoveries will be investigated and the findings coordinated with the appropriate SHPO and federally recognized Native American tribes.

Future Conditions with All Build Alternatives

No historic properties are recorded within the area of the proposed alternatives or borrow locations. These alternatives, all following the same alignment as the existing flood risk management system, were found to have a low potential for unrecorded archeological sites because they are located in areas severely disturbed by previous construction of the existing levee and are on accreted land. Because of these disturbances, the Corps recommended no

further investigations be conducted for any of the alternatives. The Kansas SHPO concurred with these recommendations.

Future Conditions with No-Action Alternative

The “No Action” alternative would result in no ground disturbances and would not have any effect on cultural resources.

10.7 VISUAL QUALITY

Existing Conditions

The Kansas River within the project area contains floodplain forest, sand bars, islands, and bluffs, which provide natural diversity to the river corridor landscapes. Cropland, grassland, and forested land are established in portions of the river’s floodplains. Existing levees and flood risk management mechanisms that have been installed to prevent bank or levee erosion interrupt the natural character of the river systems. However, flood risk management features have been in place for many years and in many instances may blend in with the adjacent natural landscape.

Future Conditions with recommended plan

Impacts to aesthetics would primarily occur during construction activities. These would be temporary, minor and would only occur within the construction areas. Also, the levees would be seeded with grasses on completion of construction.

Future Conditions with Use of Commercial Fill

With this possible modification to the Recommended Plan, the adjacent road system could receive short term aesthetic impacts of haul material deposited on the established haul travel routes. Several large dump trucks would be needed to haul the fill from the commercial dredge site to the project area. To minimize impacts to roads, the haul routes would be those that are the shortest available at the time, and follow approved truck routes. In addition, the contractor would be required to immediately remove or clean these materials from the paved roads, streets and/or highway.

Future Conditions with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system. In the absence of Federal action addressing levee improvements, a high water event could result in widespread aesthetic impacts including deposits of debris, dead trees and property damage.

Future Conditions with Relief Well Alternative

With the installation of relief wells instead of the proposed underseepage berms, impacts to

visual quality would consist of several manholes installed in the grassy areas along the levee. This would cause a small aesthetic impact during construction; however, these areas are not used as nature trails and are located along the levee right-of-way that is maintained for flood damage reduction. The addition of relief wells would only be a small addition to the existing flood risk management features. Once construction activities cease, areas around the relief wells would be re-seeded with grasses.

10.8 NOISE

Existing Conditions

This resource is institutionally important because of the Noise Control Act of 1972. The act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. A sound-level meter used to measure noise and the outputs are “decibels.” For instance, a diesel truck at 50 feet produces a sound level of 85 decibels, a gas lawn mower at 3 feet produces a sound level of 95 decibels and normal speech at three feet is 65 decibels.

Existing sound levels throughout the Topeka metropolitan area are highly variable depending on location. Sound levels range from relatively loud noises associated with urban and industrial activities to very quiet rural environments. Noise sources within the project area include agricultural and industrial activities, traffic on roads, aircraft over-flights, and natural sounds such as wind through trees and water falling over rocks. It is highly unlikely that noise standards in the Topeka metropolitan area would be exceeded under existing conditions. In portions of the metropolitan area, especially near industrial areas, sound levels could occasionally exceed noise standards under certain conditions.

Ambient noise levels are generally dependent upon the level of urban development and associated activities conducted within a given area. Land uses within the project area consist of agricultural, residential, commercial, and industrial. The principal source of noise in the project area is from farming activities, motor vehicle traffic along major highways and in urban areas, industry, and to a lesser extent from railroad traffic.

Future Conditions with Recommended Plan

Project related impacts from noise would be from operation of construction related equipment and increased construction related traffic on area roads. During the 3-year design and construction period, every effort would be made to ensure the community is aware of the project and provides any suggestions to reduce construction noise. Also, source control, site noise emissions, and limited work hours will be used on the construction sites to minimize noise emissions. Therefore, it is not anticipated that construction activities would increase noise levels beyond that typical of farming operations or area traffic in the vicinity.

Future Conditions with Use of Commercial Fill

Construction activities would require using diesel-powered dump trucks on area roads. This would produce some noise during construction periods. However, it is not anticipated that construction activities would increase noise levels beyond that typical of farming operations or area traffic in the vicinity. Also, source control, site noise emissions, and work hours will be managed on the construction sites to minimize noise emissions.

Future Condition with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system. In the absence of Federal action addressing levee improvements, a high water event could result in unregulated and widespread noise from clean-up activities.

Future Conditions with Relief Well Alternative

With relief wells, impacts to noise would not be substantial and would be essentially the same as those described under the recommended plan.

10.9 AIR QUALITY

Existing Conditions

This resource is considered institutionally important because of the Clean Air Act of 1963, as amended. Air quality is technically important because of the status of regional ambient air quality in relation to the National Ambient Air Quality Standards (NAAQS). It is publicly important because of the desire for clean air expressed by virtually all citizens.

In accordance with the Clean Air Act, the U.S. Environmental Protection Agency set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to the environment and public health. The six principal pollutants, also known as “criteria” pollutants, are: ozone, lead, particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The proposed project is located in Shawnee County, Kansas. Shawnee County and its surrounding counties are all in full attainment of all NAAQS. The surrounding counties in Kansas are rural and air emissions are not monitored. (pers. comm KDHE, 2007).

Future Conditions with All Build Alternatives

With implementation of the recommended plan, minor, short-term impacts to air quality in the project area would result from construction activities. The air quality impacts would be localized and limited to those produced by heavy construction equipment and fugitive dust within the project area. The commercial-borrow source alternative would have a slight increase in emissions and dust on haul roads and areas of clearing and excavation, but is expected to be minor and short-term. The watering of road segments could be implemented to minimize the

impact of dust and windblown particulate matter. Therefore, it is anticipated that implementation of the proposed action would conform to the National Ambient Air Quality Standards.

Future Conditions with No-Action Alternative

Under the No-Action Alternative, there would be no modifications to the existing flood risk management system. In the absence of a Federal action addressing levee improvements, a high water event could result in the release of a variety of dust, and other contaminants from clean-up activities. Air pollution from a levee failure could be widespread and generally uncontrolled relative to the minor, short term air quality impacts from the project action.

10.10 SOCIOECONOMICS

Demography

Future Conditions with the Recommended Plan

The geotechnical and structural improvements planned for the South Topeka, Oakland, and North Topeka levees in the recommended alternative would prevent adverse economic impacts, including flood damage (in all but the most catastrophic events) and high insurance premiums, to the protected neighborhoods. Flood-related building disincentives that could discourage new business start-ups and expansion of existing businesses, eventually resulting in population losses in these neighborhoods, would be prevented. Also, modest transitory population increases could occur in the study area in connection with project construction.

Future Conditions with the Use of Commercial Fill

The commercial fill alternative would involve the same geotechnical and structural repairs as in the recommended alternative. Therefore, essentially the same demographic impacts would be expected in this alternative as the recommended plan: preventing potential flood damage and investment disincentives resulting in eventual population loss, modest transitory population increases could occur in the study area in connection with project construction.

Future Conditions with the No Action Alternative

Failure to implement the recommended plan or commercial fill alternative would likely result in an increasing pattern of flood damage in the Oakland, South Topeka and North Topeka areas from the larger Kansas River flood events. This could result in Federal decertification of the levees at some point during the 50-year analysis period. Already struggling low and middle-income neighborhoods would be saddled with the additional burdens of continual catastrophic flood damage and threats to public safety, as well as the cost of higher flood insurance premiums and the economic stagnation caused by stricter building code requirements.

Substantial population losses in these areas would be all but certain in the long term. Also, a wider regional economic impact throughout the Topeka area would occur since many of the region's largest employers are behind the levees including Goodyear Tire, Payless Shoe Source, Burlington Northern Santa Fe Railroad, Hill's Pet Nutrition, Hallmark Cards, and Del Monte Foods. Any decisions by these companies to rule out expansion, reduce existing operations, or even relocate would result in substantial harm to the regional employment picture. Substantial job loss would eventually affect population levels both inside and outside the study area.

Future Conditions with the Relief Well Alternative

Under this alternative, the impacts would be the same as the recommended plan. Essentially the same demographic impacts would be expected in this alternative as the recommended plan: preventing potential flood damage and investment disincentives resulting in eventual population loss, modest transitory population increases could occur in the study area in connection with project construction.

Development and Economy

Past, Present, and Future

For information on future, past and present development trends, refer to Economics Appendix D, of the Feasibility Report.

Future Conditions with Recommended Plan

Restoring Topeka's levee system to the intended degree of flood risk management would benefit

a large portion of the city's economic base. Large urban neighborhoods in North Topeka, Oakland, and South Topeka would avoid population loss associated with a pattern of severe flooding and would continue to create consumer demand for retail and service businesses. A number of large employers located in the floodplain would be able to continue operations and possibly expand, protecting jobs and the tax base, while additional companies might relocate to Topeka. The Topeka area's water supply and sewage treatment facilities would be protected from damage or disruption in most major Kansas River flood events.

Also, flood risk management would specifically benefit several prime areas for economic development in Oakland and North Topeka that are among the best industrial and commercial future development prospects in the region. Completion of the Oakland Expressway has opened up a new set of development possibilities for the Oakland area. Nearly 300 acres of undeveloped land near the intersection of the Oakland Expressway and Seward Avenue are available for industrial development, and nearly 400 acres of undeveloped land zoned for industrial and commercial uses lie within or adjacent to Billard Airport property.

In northwest Topeka, nearly 1,500 acres of undeveloped land are available for industrial or commercial uses near the intersection of U.S. Highways 24 and 75 and northwest of the intersection of Highway 75 and Lower Silver Lake Road. Much of this area will be somewhat more challenging to develop than the comparable areas in Oakland, but development is nevertheless likely during the 50-year period of analysis. Further development prospects in North Topeka are gradually taking shape near the Kansas Avenue and Topeka Boulevard bridges over Soldier Creek. All of these areas probably would have a healthy future in the event of continuing flood damage reduction.

Future Conditions with Use of Commercial Fill

The use of commercial fill for the repair and restoration of Topeka's levee system would result in the same economic impact as the recommended alternative. A large portion of the city's economic base would benefit. Large urban neighborhoods in North Topeka, Oakland, and South Topeka would avoid population loss associated with a pattern of severe flooding and would continue to create consumer demand for retail and service businesses. A number of large employers located in the floodplain would be able to continue operations and possibly expand in some cases, protecting jobs and the tax base, while additional companies might relocate to Topeka. The Topeka area's water supply and sewage treatment facilities would be protected from damage or disruption in most major Kansas River flood events. Potential areas for development in Oakland and North Topeka would become more attractive.

Future Conditions with No Action Alternative

Continuing neglect of the deficiencies in the Topeka levee system eventually will result in catastrophic flood damage affecting large urban neighborhoods and industrial areas. Large employers in the floodplain areas might suffer severe damage or at least operational interruptions serious enough to cause them to scale back their operations at flood-prone locations, cancel expansion plans, and possibly relocate from the region. Some small business owners would be

ruined by flood damage. Other business owners and residents would incur large premium increases for flood insurance. Insurance requirements would discourage new business development and the entry of large private employers. The Topeka region's water supply facility behind the Waterworks levee unit and sewage treatment facilities in the North Topeka and Oakland areas could be damaged and their operations interrupted periodically. Also, Topeka would lose opportunities for development since many of the region's most attractive developable parcels are located in Oakland and North Topeka.

Future Conditions with Relief Well Alternative

Under this alternative, the impacts would be the same as those described under the recommended plan.

Transportation

Existing Conditions

Transportation consists of roads and byways that are found within the proposed project. The major transportation routes through Topeka are Interstate Highways 70 and 335, and State Highways 75 and 24. East-west highway access through the city is provided by Interstate Highway 70, which roughly parallels the Kansas River, while U.S. Highway 24 provides a secondary east-west route on the northern side of the area. The main north-south access route is U.S. Highway 75. Interstate Highway 335 runs from Topeka to the southwest, eventually joining Interstate Highway 35, the "NAFTA Highway."

Future Conditions with the Recommended Plan

With implementation of the recommended plan, there would be slight disruptions to traffic with construction equipment traveling to and from the project area. However, no roads are anticipated to be blocked or closed for extended periods of time. Most of the project area would be accessed from the levee road and should not interfere with the normal flow of traffic.

Future Conditions with the Use of Commercial Fill

Trucks hauling fill to the construction site may have temporary impacts to local roads, causing congestion, and possibly damage to the roads. Specifically, there is the potential that the roads or bridge would require early maintenance due to excessive wear and tear. This maintenance could include milling off the existing surface to eliminate potential rutting and surface irregularities, patching the road and base in failed areas, overlaying with asphalt, and then replacing the pavement striping.

Future Conditions with the No-Action Alternative

The No-Action alternative would involve no construction activity and no change in project operations. This alternative could pose a problem to transportation during a 100-year flood event. Area roads could be flooded, impairing evacuation and rescue of the local population. Roads also could be washed out and require reconstruction.

Future Conditions with the Relief Well Alternative

With the installation of relief wells instead of the proposed underseepage berms, impacts to transportation resources would not be substantial and would be the same as those described under the recommended plan.

11.0 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES

A Hazardous, Toxic, and Radioactive Waste (HTRW) assessment was completed as part of the Topeka, Kansas Reconnaissance Report (USACE, 1997), and a more recent assessment (USACE, 2007) of the potential HTRW resources was completed. The conclusions of the 2007 assessment are summarized below, and a complete write-up is included in Appendix H. It included a database search and site visit to identify areas of concern within 500 feet of either side of the levee. No sites registered in the database were reported on the National Priorities List, Comprehensive Environmental Response, Compensation, and Liability Information System, and Kansas Hazardous Waste Sites Report.

Conclusions and Recommendations

Overall, the environmental assessment found very little risk associated with HTRW contamination on proposed activities. However there were three areas where there was a potential HTRW or solid waste impact to the proposed work. The lateral limits of any contamination must be established to ensure that remediation measures are incorporated into the final construction plans.

South Topeka Unit, Station 74+41 to 93+86

There is a possibility that groundwater below a portion of this area is contaminated with chlorinated solvents. The potential for floodwall replacement activities to encounter contaminated groundwater will be investigated during the Pre-Construction Engineering and Design phase. The operation of new facilities will not result in the discharge of groundwater to the surface.

South Topeka Borrow Site

A former city dump was identified at the southwest corner of the proposed borrow area. The limits of the disposal cells are unknown so there may not be as much borrow area available as

anticipated. Investigations are recommended to determine the nature of materials accepted and the lateral limits of the dump. Also, samples from the proposed borrow should be collected and analyzed to ensure material to be used on other sites is clean.

Oakland Borrow Site

A former city dump was identified at the southwest corner of the proposed borrow area. It was described as having debris from a 1968 tornado. The limits of the disposal cells are unknown so there may not be as much borrow area available as anticipated. Investigations are recommended to determine the nature of materials accepted and the lateral limits of the dump. Also, samples from the proposed borrow should be collected and analyzed to ensure material to be used on other sites is clean.

Also, it is recommended that any soil removed from a site associated with the levee work be analyzed to ensure proper disposal. Any soils used to upgrade the levee system should be analyzed to ensure it is not contaminated.

Both of these practices ensure that contamination is not being inadvertently spread from one site to another.

12.0 ENVIRONMENTAL JUSTICE

The Executive Order on Environmental Justice (EO 12898) requires consideration of social equity issues, particularly any potential disproportionate impacts to minority and low-income groups. This is to ensure that issues such as cultural and dietary differences are taken into consideration to ensure that adequate risk is evaluated (EPA, 2004). Environmental Justice (EJ) means the fair treatment and meaningful involvement of all people regardless of race, income, or culture, in the developing, carrying-out, and enforcing of environmental laws, regulations, and policies. In addition, the Executive Order on the Protection of Children from Environmental Health risks and Safety risks (EO 13045) requires the consideration of disproportionate impacts to children. Children under age five and elderly populations above age 65 are considered to be sensitive populations that may experience disproportionate impacts from environmental stressors.

To determine any potential impacts of this project to the surrounding populations, present and potential environmental impacts were taken into consideration with regards to the current facility concentration and compliance history to determine disproportionate environmental burden. To determine any potential EJ areas and/or sensitive populations, the racial, income, and age composition of the individual census tracts within, and adjacent to the study area, were examined using 2000 census data.

Facility Concentration

Currently there is no regional threshold to determine an acceptable concentration of facilities. However, the EJ Program relies on looking at facility density within the study area compared to surrounding communities and the county it resides in. High facility concentration with potential

additional environmental and/or human health burdens increases the risk or harm that may be shouldered by low-income and/or minority populations. Any facilities located in close proximity to sensitively populated areas of children and/or elderly age groups are also of concern.

The North Topeka area reports the highest concentration of active permitted facilities within the study area, while the Oakland area reports the lowest concentration.

Demographic Composition

Tables 3 thru 7, Appendix A, provide localized demographic data for the areas and zip codes of the project area that include: Auburndale, South Topeka, Oakland, North Topeka, and Soldier Creek Urban. EPA Region 7 uses a 25% or greater threshold in the identification of low-income and/or minority populated areas as an indicator for the potential for environmental justice concerns in conjunction with disproportionate environmental impacts. This threshold was determined through an economic and demographic analysis of the entire Region 7 area.

The South Topeka, Oakland, and North Topeka areas have the highest minority populations within the study area, and are represented by residents of African American and Hispanic or Latino heritage (Appendix A, Table 3). These areas also consistently had higher percentages of persons below the poverty level (Appendix A, Table 4). The core of Executive Order 12898 provides for the protection of both minority and low-income groups. Therefore, income and racial composition data from the 2000 Census were used to provide an overview of each levee unit in regards to their respective minority and income level composition. The Office of Management and Budget's Statistical Policy Directive 14 of the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. If a family's income is less than that family's threshold, then that family, and every individual in it, is considered poor.

Additional Environmental Justice Indicators

Additional environmental justice indicators such as education level, languages spoken, and percent children and elderly reveal trends about the socio-demographic aspects of a community that may be used to make generalizations about the population and the capacity of residents to cope with potential additional environmental stresses. The level of education and/or literacy rates for the adult population provides a critical measure of the likelihood and the ability of the community to know about and participate in public meetings, to comment on written proposals and to otherwise participate in the decision-making process. If tools used to encourage public participation are not tailored to local education rates, or perceived rates, the outreach process may be ineffectual (USEPA, 2004). Based on the educational attainment data of the percent of persons that earned high school diplomas or higher and college degree or higher, the areas of South Topeka, Oakland, and North Topeka have the lowest rates among all the study areas (Appendix A, Table 5).

Information on whether languages other than English are spoken among the population, and

percentage distribution of these languages, is important in determining effective public participation processes. According to the U.S. Census Bureau (2000), the most common language spoken at home, by individuals age five and over, is English. Spanish is the second language other than English that is spoken in the South Topeka, Oakland, and North Topeka study areas (Appendix A, Table 6). Residents residing in the Oakland study area have the lowest English proficiency rate and the highest population of Hispanic or Latino ethnicity residents. Additionally, there are a small percentage of persons residing in the study areas that speak an Asian or Pacific Island language as the most common language spoken at home.

Children under age five and elderly populations above age 65 are considered to be sensitive populations that may experience disproportionate impacts from environmental stressors. The table below provides insight into a subpopulation that exists within the study area in comparison to County averages (Appendix A, Table 7). Generalizations conclude that the Oakland study area has the highest percent of children under age five and the Auburndale study area indicate the highest percent of residents age 65 and over.

Finding of No Disproportionate Impacts

Based on data obtained from EPA's Online Tracking Information System (OTIS) which contains detailed facility information, the study areas do not have a significant overburden concentration of permitted active and/or operating facilities that pose a disproportionate negative impact to the community. In addition, the facilities in the study areas do not have a disproportionate number permit violations. Although the project area does contain EJ populations such as minority and low-income groups, they would not be disproportionately impacted in a negative way; rather these groups would equally benefit from the reduced risk of flooding if this project is implemented.

The levee modifications would be primarily constructed adjacent to and/or within industrial and agricultural areas, and are not anticipated to cause any disproportionate impacts to sensitive populations, but are anticipated to provide a safer living environment. Given the demographics of the project area, the public involvement process would utilize a specific public communication strategy that would focus communication on the most potentially impacted areas to communicate the proposed flood risk management project. In addition, a list of community resources within the project area provided by USEPA would be used to ensure that project components will be communicated to residents who might not otherwise become aware of the project and draft EA availability through the standard methods. Since Spanish is the second major language spoken among residents in the Oakland unit, measures would be taken to ensure effective communication regarding the project is made. Such measures would include translation of the project's public notice and public meeting announcement into Spanish and circulating the notices within various Spanish community outlets, churches, news media, and etc. In addition, the notice would provide the name of a translator designated as a person of contact for non-English speaking residents to obtain more information regarding the project.

13.0 MITIGATION

The Topeka flood risk management project would impact about seven and one-half acres of a 25-acre woodland due to installation of an under seepage berm at the South Topeka unit. To offset the loss of this impact, a replacement of 15 acres of riparian woodlands is proposed. In addition to reduce impacts to nesting birds, no construction activities in woodland areas would occur during the migratory bird nesting season from April 1 to July 15. A detailed mitigation plan can be found in Appendix F.

14.0 CUMULATIVE IMPACTS

The proposed action consists of modifications to an existing levee system in the Topeka area. Cumulative impacts of the proposed action, consists of relatively minor adverse impacts to the natural environment and aesthetics, with overall positive benefits to the socio-economic environment based on an improved level of protection to the local infrastructure. The project action is not expected to induce development since this plan would result in modifications to an existing levee system. The proposed action would not involve a levee raise or additional levees, but would only correct existing geotechnical and structural weaknesses to increase the reliability of the flood risk management system for the City of Topeka. Implementation of the project would involve temporary impacts to prime farmland identified as borrow sources, aesthetics, wildlife resources, and human environment thru construction- related noise and minor traffic disruptions. Adverse impacts are limited to the loss of seven and one-half acres of woodland. Mitigation for this loss would include replacement of the seven and one-half acres with 15 acres of soft and hard mast producing trees and shrubs, native grasses and forbs. In addition, to reduce impacts to nesting birds no construction activities in woodland areas would occur during the migratory bird nesting season from April 1 to July 15.

The project induced impacts to agricultural areas are considered temporary because steps would be taken to allow these areas to return to agricultural use after borrow and construction operations. Such measures would include preservation of the top layer of soil, which would be returned to the site, minimizing excavation depths to reduce impacts to the drainage of fields, and excavating after the harvest season to minimize impacts to crops. In addition, no adverse direct or indirect impacts to aquatic resources or water quality are anticipated to occur from project construction activities. For all construction activities, Best Management Practices would be used to minimize the introduction of fuel, petroleum products, or other deleterious material from entering into the waterway and adjacent resources. Control measures would include use of erosion control fences; storing equipment, solid waste, and petroleum products above the ordinary high water mark and away from areas prone to runoff; and requiring that all equipment be clean and free of leaks. In addition, no disproportionate impacts to minorities and low-income groups, and sensitive populations are anticipated to occur from project-related activities.

Past actions such as the clearing of forest for timber and urban and industrial development, flood control, as well as the conversion of forest to agriculture have contributed to substantial adverse

impacts to the Kansas River ecosystem. Loss of floodplains and wetlands to agriculture and development has caused loss of biodiversity (USFWS, 2000). In general, flood risk management reservoirs, dams and weirs have lead to ecological deterioration, increases in contamination, disruption of sediment transfer, and hindrances to fish passage to upstream reaches (Merritt and Cooper, 2000; Mant and Janes, 2006). Also, river bed degradation of the Kansas River has been attributed to commercial sand and gravel dredging (Simons et al.1984 and Kansas Geological Survey, 1998). However, in 1990 the Corps implemented a regulatory program for commercial dredging activities on the Kansas River, which consisted of dredging restrictions to minimize impacts and a monitoring program to assess the impacts of permitted dredging activities.

Other land changes have resulted from construction of levee systems and major changes in transportation over the past several decades (e.g. highway construction and improvements, bridge replacements and rehabilitations). Federal flood risk management involvement within the Kansas River levee units was initiated between the 1940's and the early 1950's, and again after the 1951 flood. The 1951 flood contributed to the support for building flood control reservoirs and improving levee systems throughout eastern Kansas. In Topeka, Federal flood risk management projects consisted of the construction of floodwalls, earthen levees, channel improvements and drainage structures for various levee units. Additional improvements to the levee system were completed in the late 1970s. Today, most of the project area is developed with residential, commercial and industrial development.

Future actions planned for the Topeka area over the next 20 years include major transportation projects (e.g. roads, bridges, transit services, paratransit services, bicycle facilities, and pedestrian facilities) and these actions may result in additional loss of woodland habitat.

In addition, the Kansas Department of Transportation is developing a long-range statewide transportation plan for various transportation improvements that include the Topeka area, which also could result in additional loss of existing woody areas.

The impacts resulting from proposed modifications to the existing levee system consist of minor and short term impacts on the human environment and include measures to compensate for the loss of woodland and restore grass and agriculture areas impacted from the project; as well as best management practices to avoid impacts to aquatic resources and water quality. Therefore, these project impacts are considered minor and insignificant when added to other past, present or future actions.

15.0 CONCLUSION

The purpose of the proposed action is to increase the reliability of the flood risk management system for the City of Topeka. During the study phase, issues of concern identified by Corps of Engineers' representatives were geotechnical and structural. The proposed modifications consist of installation of landside underseepage berms, heel extensions, fill behind floodwalls, new pressure relief wells, wall stiffener on Kansas Avenue Pump Station, stability berms, removal of Fairchild Pump Station, replacement of section of the floodwall, and replacements of floodwall

gatewells and sluice gates.

This EA has assessed the environmental impacts of the recommended plan, and alternatives. The recommended plan represents the plan with the highest net economic benefits and has relatively minor impacts to the natural environment with overall positive benefits to the socio-economic environment. Impacts to the natural environment are minor because the project is located within a previously disturbed environment that is highly industrial and urbanized. The main impacts to the natural environment include the loss of about seven and one-half acres of woodland from the proposed construction of the underseepage berm at South Topeka unit. However, these impacts would be offset by replanting a total of 15 acres of woodland habitat within the South Topeka and North Topeka project areas. Additional mitigation measures would include the avoidance of construction activities in woodland areas during the migratory bird nesting season of April 1 to July 15. In addition, the environmental assessment found minimal risk associated with HTRW contamination from proposed activities. However, there were three areas where a potential HTRW or solid waste impact could occur. Therefore, any soil removed from a site associated with the levee work or borrow areas would be analyzed to ensure proper disposal. Based on the environmental assessment, it has been determined that the recommended plan would not have any substantial adverse impacts on the natural and human environment. All practicable means to avoid and/or minimize adverse environmental effects have been incorporated into the recommended plan. Therefore, the recommended plan is the environmentally preferable alternative.

16.0 COORDINATION

Preparation of this EA and a draft Finding of No Significant Impact (FONSI) has been coordinated with appropriate Federal, state, and local agencies. Copies of this EA will be sent to the following agencies, environmental groups, and other interested parties.

- U.S. Department of the Interior, Fish and Wildlife Service, Region III
- U.S. Environmental Protection Agency, Region VII
- USDA, National Resource Conservation Service, Kansas State Conservationist
- Federal Aviation Administration
- Federal Railroad Administration
- U.S. Federal Highway Administration
- U.S. Coast Guard Marine
- U.S. Geological Survey
- National Park Service
- U.S. Federal Emergency Management Agency, Region VII
- Kansas Biological Survey
- Kansas Department of Wildlife and Parks
- Kansas Geological Survey
- Kansas State Historical Society
- Kansas Water Office

- Kansas Department of Transportation
- Kansas Department of Health and Environment
- Kansas Department of Agriculture
- Kansas State Conservation Commission

17.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Environmental compliance for the proposed action would be achieved upon: coordination of this EA with appropriate agencies, organizations, and individuals for their review and comments, and the FONSI would not be signed until all comments are resolved and the proposed action achieves environmental compliance with applicable laws and regulations, as described. Coordination with the appropriate Federal and state agencies has been made in preparation of this EA.

The Endangered Species Act, Section 7, (USFWS) concluded on May 29, 2007, and (KDWP) on June 1, 2007 that the proposed action would not be likely to adversely affect any endangered or threatened species.

The National Historic Preservation Act, Section 106 concluded on August 25, 2006 for determination of No Affect on cultural resources. Coordination with tribal government would be achieved during the 30-day public review period of the EA.

It was determined that the project action would not result in the placement of fill or dredged material in the waters of the U.S and wetlands; therefore, the Clean Water Act sections 401 and 404(b)(1) permits are not required for this project.

The Clean Air Act (CAA) compliance would be achieved upon review and comments by EPA, and provided their concurrence that the project action conforms to CAA state implementation plans.

The Fish and Wildlife Coordination Act report (draft) was received on September 29, 2007, (final) was received on March 16, 2007. The acceptance or resolution of all USFWS Coordination Act recommendations would be achieved before a FONSI is signed.

The Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES) permit would be obtained from the Kansas Department of Health and Environment during the design phase of the project as the plans and specifications for the project are completed.

Environmental Laws and Regulations Compliance	
Clean Air Act, as amended, 42 U.S. C. 7401-7671g, et seq.	Full Compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full Compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq	Not Applicable

Endangered Species Act, 16 U.S.C. 1531, et seq.	Full Compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not Applicable
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.	Full Compliance
Federal Water Project Recreation Act, 16 U.S.C. 4601-12, et seq.	Not Applicable
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Full Compliance
Land and Water Conservation Act (16 U.S.C 4601-4 et seq	Not Applicable
Marine Protection, Research, and Sanctuaries Act 33 U.S.C. 1401, et seq	Not Applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full Compliance
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et seq.	Full Compliance
Noise Control Act, 42 U.S.C. 4901-4918	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full Compliance
Wild and Scenic River Act, 16 U.S.C. 1271, et seq.	Full Compliance
Protection & Enhancement of the Cultural Environment (Executive Order 11593)	Full Compliance
Floodplain Management (Executive Order 11988)	Full Compliance
Protection of Migratory Birds (Executive Order 13186)	Full Compliance
Protection of Wetlands (Executive Order 11990)	Full Compliance
Environmental Justice (Executive Order 12898)	Full Compliance

- a. Full Compliance. Having met all requirements of the statute for the current stage of the project.
- b. Not Applicable. No requirements for the statute required.

18.0 PREPARERS

This EA and the associated draft FONSI were prepared by Ms. Lekesha Reynolds (Biologist), with relevant sections prepared by Mr. Paul Speckin (HTRW); Mr. Timothy Meade (Cultural Resources); Mr. Alan Holland (Socio-Economics), and Mr. Eric Lynn (Project Manager). The address of the preparers is: U.S. Army Corps of Engineers, Kansas City, District; PM-PR, Room 843, 601 E. 12th St, Kansas City, MO 64106. In addition, the Environmental Justice section of this EA was prepared with the assistance of Ms. Debbie Bishop, an Environmental Justice Specialist of the U.S. Environmental Protection Agency, Region VII, Kansas City, Missouri.

19.0 REFERENCES

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